agricultural marketing

APRIL 1958

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AGRICULTURAL MARKETING SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

agricultural marketing

Volume 3, Number 4

Contents

April 1958

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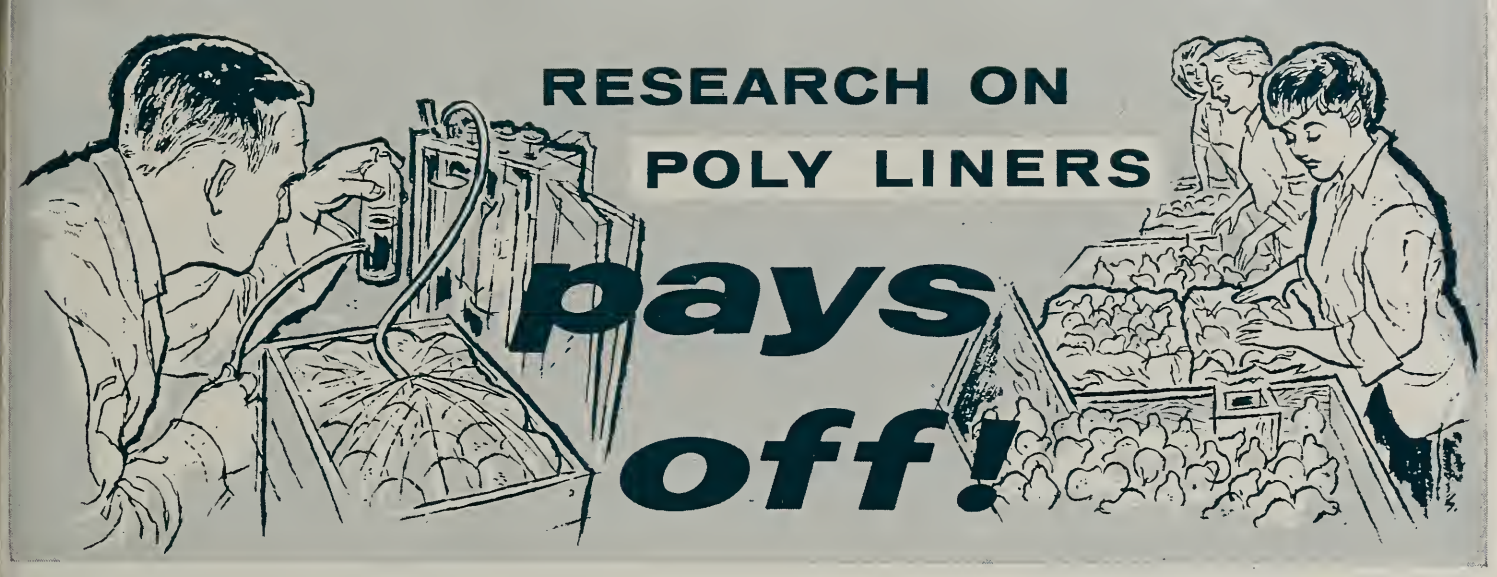
AGRICULTURAL MARKETING is published monthly by the Agricultural Marketing Service, United States Department of Agriculture, Washington 25, D. C. The printing of this publication has been approved by the Bureau of the Budget, March 20, 1956. Yearly subscription rate is $1.50, domestic; $2, foreign. Single copies are 15 cents each. Subscription orders should be sent to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.



RESEARCH ON POLY LINERS pays off!

by HAROLD T. COOK

Ever save a million dollars?

That's the nice round sum the Northwestern pear industry figures it saved in 1956 by packing 80 percent of its crop in polyethylene-lined boxes.

And a million dollars is a conservative estimate. The premium for polyethylene-lined boxes of pears late in the season probably ran as high as 75 cents to $1 a box. The million-dollar savings only figures a 30-cent-a-box premium.

But no matter how it's figured, the savings has come as a result of the research efforts of the Agricultural Marketing Service. Constantly searching for new ways to bring farm products to the consumer in better condition at less cost, AMS has made tremendous strides in its work with polyethylene.

Before polyethylene film could be used successfully, several years of research were necessary to find out just what type of film to use and under what conditions. What suited one variety or kind of fruit didn't always work well for another. For each, individual research projects had to be carried out.

Fisk Gerhardt, senior pathologist in the Biological Sciences Branch, AMS, did most of the work with poly-liners for pears. Through his experiments with Bartlett, Anjou, Bosc, and Comice pears, both the storage life and shelf life of the fruit were lengthened considerably.

Informed of these research developments, the pear industry rapidly put the Gerhardt findings to commercial use. The first few carloads of Bartletts and Anjous went to market in poly liners in 1952. By 1956, two-thirds of the Northwestern pear crop were poly-packed; nearly 80 percent of the Anjou crop used polyethylene lined boxes.

The story was much the same for the Northwestern sweet cherry crop. Nearly all the cherries from this area are now packed and shipped in sealed 1.5-mil polyethylene box liners—at an annual savings of about $600,000.

In this case, much of the savings comes in reduced transportation charges. Cherries no longer need to be rushed across the country by express. The film liners delay softening enough to allow fruit to be shipped by freight at a considerable savings.

Further savings, of course, result from marketing a better product, fresh and bright in appearance and fairly free from decay.

Fisk Gerhardt again conducted much of the research work that went into perfecting poly liners for sweet cherries. He was aided by H. A. Schomer and T. R. Wright at the Wenatchee, Wash., field station.

Apples, too, are now going to market in much better condition thanks to polyethylene research. A. Lloyd Ryall and M. Uota at Fresno, Calif., worked with Yellow Newtown apples; R.E. Hardenburg and H.W. Siegelman at Beltsville, Md., did research on Rome Beauty, Arkansas, Grimes Golden, and Jonathan apples; and Edwin Smith at Wenatchee developed the best method of storing Golden Delicious apples in poly-lined boxes.

Golden Delicious have always presented the problem of shriveling. Research showed that nonsealed liners prevented shriveling in Northwestern grown Golden Delicious and reduced it to some extent in Eastern grown fruit.

Golden Delicious packed in polyethylene were sold at retail in much better condition and lasted longer into the marketing season. Anywhere from 50 cents to $1 could be added to the value of a box of apples marketed in poly liners, with a total increased return of over $100,000 a year to the industry.

Strawberries also benefit from poly liners—but not in the marketing of the fruit. Strawberry plants keep much better and much longer when put into storage in polyethylene liners than when packed in the conventional wet moss. Plants are easier to handle, and use of polyethylene reduces both materials and shipping costs.

As a result of research conducted by John T. Worthington, AMS, and D.H. Scott, ARS, at Beltsville, more than 100,000,000 strawberry plants are now stored each year in poly-lined crates.

The author is Assistant Chief of the Biological Sciences Branch, Marketing Research Division, Agricultural Marketing Service.

MARKETING POTATOES IN FIBERBOARD BOXES

by PHILIP W. HALE
and PETER G. CHAPOGAS

CALIFORNIA Long White potatoes shipped to eastern markets in fiberboard boxes come through in much better condition—with less bruising and less discoloring—than potatoes shipped in conventional burlap bags.

This was the finding of AMS researchers who recently conducted studies in 7 terminal markets and 5 packing plants to compare the use of fiberboard boxes and burlap bags in shipping potatoes.

Fifteen test shipments of potatoes were checked. A comparison of potatoes shipped in fiberboard boxes and those in the bags showed the boxes carried the potatoes better, with less bruising and discoloring. All through marketing channels, the boxes were handled more gently; they were more attractive and displayed the potatoes to better advantage.

About 21 percent of the potatoes shipped in bags were skinned and discolored upon arrival, compared to only 11 percent in fiberboard boxes. Bruising averaged less than 0.5 percent in boxes, while it ran almost 15 percent for potatoes in bags.

Bruising was particularly bad in bagged potatoes placed on the floor layer of the railroad car. This bruising did not occur when potatoes were shipped in fiberboard boxes. Although some boxes tended to compress slightly when loaded at floor level, neither the appearance of the containers nor the condition of the potatoes was affected.

The fiberboard container used in these experiments held 50 pounds of potatoes. It was a 2-piece box with a full telescope top. Ventilation was provided by either one of two methods. The box had 2 vent slots, 3 inches long and ¼-inch wide on each side. or 6 round holes, 1¼ inches in diameter, punched in the top and bottom flaps.

The AMS study, conducted in cooperation with the Kern County Potato Growers Association, showed that both packing labor and container costs were higher for the fiberboard boxes. However, the receivers paid an average premium of 51 cents per 100 pounds for potatoes packed in the boxes. And this premium took care of the added cost of using fiberboard containers.

Packing 100 pounds of potatoes in two 50-pound fiberboard boxes and loading them into a freight car cost 42 cents more than packing and loading a 100-pound bag, and 31 cents more than two 50-pound bags.

On a per container basis, the cost of the fiberboard box was about twice that of its equivalent burlap bag. A 50-pound box cost 28.6 cents, while a bag holding 50 pounds of potatoes cost only 14.4 cents. The 100-pound burlap bag cost 18.6 cents.

Direct labor costs to pack 100 pounds of potatoes in fiberboard boxes came to 5.29 cents compared to 3.54 cents for the 50-pound bags and 2.35 cents for the 100-pound bags.

Because the boxes were comparatively new to the potato industry, most of the packing plants did not want to invest in automatic machinery until the trade reaction was proven favorable. Therefore, most of the packing operations for the AMS study were manual, resulting in higher labor costs.

There was also a higher charge for shipping potatoes in fiberboard boxes because the billing weight was 106 pounds for 2 boxes but only 101 pounds for the large bags. From Kern County to New York City, the extra freight charge was $35.10 a carload more for potatoes in boxes than in bags, or 10 cents more per hundredweight.

Despite the extra costs involved in marketing potatoes in fiberboard boxes, most of the trade was enthusiastic about the new containers. It felt the additional protection, handling convenience, and sales appeal made the higher cost worthwhile. However, a few wholesalers thought that the cost might be a problem, particularly in a declining market.

The cost of packing potatoes in fiberboard boxes probably will be about the same next season. However, several packers who have had experience with the boxes feel that, with more mechanized packing equipment, the cost of shipping in boxes can be reduced. Therefore, a premium of about 40 to 50 cents per 100 pounds (f.o.b. California) would be necessary for the shippers to pack profitably in boxes next year.

The authors are staff members of the Marketing Research Division of AMS.

Vegetables for Salads

There's a distinct trend in vegetable growing to increased production of the types used in salads. AMS finds production of salad vegetables up more than 50 percent since 1940; of other fresh vegetables, 10 percent.

WAREHOUSING FORMULA FEEDS

by WILLIAM R. ASKEW and CARL J. VOSLOH

MARKET researchers have been taking notes on the use of labor in the feed industry, and the findings indicate there's a sizable hunk of time and money to be saved.

In one recent AMS study of Midwest warehouses for formula feeds, labor totaled 69 percent of all warehousing costs. What's more, 29 percent of the worker's time was nonproductive, largely because of poor management.

In other words, about 20 cents of each dollar spent for warehousing pays for idle time.

About 7 percent of the worker's time is taken up with necessary rest breaks or breathers. But that still leaves 22 percent—or 1 hour and 45 minutes of his day—that isn't being used productively.

Most of the nonproductive labor time in the warehouse is caused by the worker having to wait for previous operations to be completed. The remainder is the result of waiting for cars or trucks, for a change in loading, or when the work flow slows up or his job is changed.

Only management can organize operations to reduce such delays.

Unhappily for the man who pays the bills, 29 percent is a conservative estimate of the time lost. A large part of the cleaning work done by laborers between operations is little more than "make-work."

AMS researchers studied 6 warehouses using forklifts, handtrucks, or conveyor belts. When the warehouses were divided according to the handling method used, the forklift truck system had the smallest proportion of waste and "break" time—25 percent of total time. Waste and "break" time in handtruck and conveyor belt warehouses accounted for 27 and 36 percent of their time.

When the worker is engaged in his job, manual handling takes about 45 percent of his time, with loading and unloading calling for most of the work and cleanup chores taking about 21 percent of this time.

Carrying the feed from one place to another takes another 26 percent of on-the-job time. About one-third of the transportation time is spent in returning empty-handed from loading or handling movements. The remainder of the time is consumed by rest or just plain waiting for the operations to catch up with the worker.

The market researchers also measured the efficient use of labor on an individual basis. They gave the fully occupied worker an arbitrary rating of 100. When working, the men averaged 99 percent efficiency. But when rest and delay time was included in the score, the individual average was only 70 percent, with the top worker hitting 75 percent and the lowest dropping to 60.

It all goes back to the same cause, waiting around for another load or shipment or job.

The same scoring method showed that the conveyor belt is the least efficient of the three handling systems. The average worker in a forklift warehouse rated 75 percent; in the handtruck warehouse, he scored 73. But the average worker in the conveyor belt warehouse came out only 64 percent efficient.

Most of the delays in warehouse operations are caused by changeovers or intermittent flow of work, and these delays are concentrated at the loading or takeoff station. Since a conveyor belt system usually has two takeoff stations with two men at each station, any delay in operation involves 4 men, instead of the 1 or 2 in the handtruck or forklift system. And the men are more or less tied to their tables, whether there is anything on the belt at the moment or not. As a result, they can't occupy themselves with other jobs.

On the other hand, a conveyor belt does eliminate double handling. And if a warehouse ships enough feed direct and doesn't carry too many varieties, a conveyor belt may be a more economical operation.

Handling feed in bulk is one way to cut down on unnecessary labor, according to the researchers. Though the conclusions were only tentative, the warehouse survey suggested that the difference between bulk and bag handling could be as much as 10 tons per man-hour, or 14 tons per man-hour for bulk instead of 4 tons for bags.

Another study by the market researchers pointed out possible standards for labor use in custom feed mills in the Midwest. The study indicated that 1 man should be able to handle 4.5 tons of grain an hour, even making allowances for necessary interruptions in work.

Another man-hour would be required in receiving and mixing 2.7 tons of feeds. And 1 man-hour for packaging or bagging would produce 2.2 tons of feed.

To add the figures another way, a custom feed mill that grinds 15 tons of grain and mixes 10 tons of feed a day can bag 2 tons and deliver 15.5 tons of grain or feed to the farmer's truck in bulk in a total of 8 man-hours.

Both studies indicate that management should take a good look at how it is using labor.

The authors are staff members of the Marketing Research Division of AMS.

WHAT ARE TOBACCO GRADES?

Federal grades are applied to all tobacco sold at auction. This amounts to 95 percent of the U. S. crop.

by QUENTIN W. ROOP

NOWHERE else in the marketing of agricultural products do you find as many grades as in the marketing of tobacco. To classify the many variations of kind and quality adequately, 2,683 Federal tobacco grades have been developed.

Established by the Tobacco Division of the Agricultural Marketing Service, these grades are applied to all tobacco sold at auction—about 95 percent of the U.S. crop.

Despite common usage, Federal grades for tobacco are not always clearly understood by all who use them.

Tobacco grades are based, first of all, upon the U.S. standards, which are written descriptions of the physical properties and characteristics of tobacco. The standards provide, basically, for major classes and types within which there are numerous grades.

There are 6 USDA classes for tobacco: Class 1, Flue-cured; Class 2, Fire-cured; Class 3, Air-cured; Class 4, Cigar-filler; Class 5, Cigar-binder; and Class 6, Cigar-wrapper.

Within these classes, tobacco is identified by types, according to its characteristics and uses. Class 3 (Air-cured), for instance, has 5 types: Type 31, Burley; Type 32, Maryland Broadleaf; Type 35, One Sucker; Type 36, Green River; and Type 37, Virginia Sun-cured.

Tobacco grades are defined according to three factors: group, quality, and color.

Group is determined by the position of the leaf on the stalk and reflects the traditional farm method of priming, stripping, or sorting. Typical of these groups are those for Flue-cured tobacco. They include: Leaf—leaves from the top of the stalk; Cutters—leaves from the mid-position of the stalk; and Lugs—leaves from the bottom of the plant.

Quality—the second factor of grade—is defined either as Choice, Fine, Good, Fair, Low, or Poor. Smoothness, oil, maturity, body, width, porosity, finish, and uniformity determine the quality designations.

Color is the third grade factor. Each quality of the Leaf, Cutters, and Lugs groups, for instance, is classified by its particular color.

In addition to these three main factors of a grade, a fourth is used when tobacco has a peculiar characteristic not covered by the other grade specifications.

Within each of the 26 types of tobacco—group, quality, and color are highly variable. As a result, each type of tobacco has anywhere from 20 to 150 grades.

This system of standardization is one of the most elaborate used for agricultural products. It is made necessary not only because of the variable nature of tobacco, which is highly affected by soils, climatic conditions, and methods of curing, but also by the importance placed by industry on the differences between the various kinds and qualities of tobacco.

The standards are intended to provide a yardstick of quality, value, and usefulness in tobacco.

Since the value of a particular tobacco depends primarily upon its fitness for a specific use, it is imperative that the standards be kept flexible enough to reflect changes in the marketing pattern. With this in mind, the Tobacco Division from time to time makes changes in the standards.

Chemical analyses of tobacco are currently being made by the Tobacco Division and a number of Federal, State, and industry laboratories. Perhaps, in the future, these may throw additional light on the relationship of grades to commercial utilization.

The first published report on this project, "The Chemical Composition of Representative Grades of the 1951 and 1952 Crops of Burley Tobacco," will be issued by USDA within the next few months.

Underway at present is a comprehensive correlation study which will relate the findings of chemists who analyzed representative grades of both Burley and Flue-cured tobaccos to the physical factors on which these grades were based.

The author is a tobacco technologist in the Tobacco Division of AMS.

With the machine method of field packing, a large work crew is used to cut, trim, and pick up the lettuce. The packing unit is self propelled.

The trailer-pack method is shown here. A much smaller crew is used, and the packing unit is pulled by a truck which also holds packed cartons.

MARKETING COSTS FOR LETTUCE

by ALVIN Z. MACOMBER

WHEN the California lettuce industry recently moved its packing operations out of the sheds and into the fields, it cut harvesting and packing costs by 22 percent.

AMS researchers figure that in 1953 it cost about $1.89 per crate to haul lettuce to the sheds and pack and ice it for shipment. Using the field packing method, this operation —now involving vacuum cooling— cost $1.48 for 2 fiberboard cartons. (Two fiberboard cartons hold the equivalent of 1 crate.)

Three years later, with 95 percent of the California lettuce industry converted to the new packing and cooling method, this cost had risen only 6 cents. It now stood at $1.54 for packing 2 cartons of lettuce.

What the lettuce industry actually did was to move the packinghouse to the field. The cutting and packing crew now work with the harvesting machine—cutting, trimming, grading, and packing the lettuce in one operation. The cartons are then closed and hauled directly to the plant where they are vacuum-cooled and shipped.

When lettuce is vacuum-cooled, the cartons are sealed in airtight cylinders, and the air pressure is reduced. Evaporation decreases the internal temperature to 35 degrees in 20 to 30 minutes. The faster the lettuce is cooled after harvest, the longer the market life can be maintained.

The AMS study compared the cost of marketing California lettuce in Chicago and New York City between 1946 and 1956. Shipments from the Salinas-Watsonville area and the Imperial Valley account for 60 percent of U.S. lettuce shipments.

In 1946 the difference between what the California lettuce shipper got for a crate of lettuce and what the New York consumer paid was about $4.20. In 1956 the difference in price was about $6.70 for 2 cartons of lettuce. In Chicago, during the same period, the marketing margin for lettuce rose from $3.26 to $5.70. AMS market researchers believe the use of vacuum-cooled cartons helped to keep the margins from rising even more.

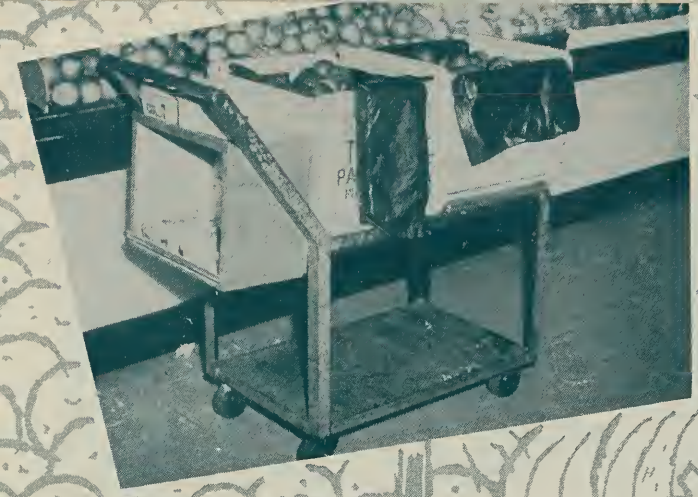
When it comes to the separate wholesale and retail margins, the two cities showed marked differences in the 10-year span. The average wholesale margin in New York for 1955-56 was 50 percent greater than the 1946-47 margin. But the margin in Chicago remained about the same. Chicago, however, showed a larger increase in the retail margin during these years. The retail spread for Chicago went up 85 percent; in New York it rose only 25 percent.

But, as the researchers point out, marketing costs for lettuce are higher in New York than in Chicago—even when allowance is made for the extra transportation cost to New York. They say the difference probably is due to higher costs of cartage and handling in New York.

For example, 2 cartons of lettuce from the Salinas-Watsonville area sold for $10.38 at retail in Chicago in October 1956. Of this money, the grower got $2.76. Harvesting and packing, including the cost of the cartons, took an additional $1.02. The market costs at shipping point, which covered precooling, loading, advertising, and the like, were $0.52. Transportation for the 2 cartons of lettuce was $2.12. And wholesale returns were $1.58. The return to the retailer, allowing for waste and spoilage, was $2.38.

When these same 2 cartons of lettuce went to New York City, the costs were the same through the shipping point. But transportation for New York-bound lettuce was $2.56. Wholesale costs were $1.54, and the return to the retailer for 2 cartons of lettuce was $3.34. So, costs and returns for New York City added up to $11.74.

The author is a staff member of the Marketing Research Division of AMS.



A PLAN FOR DISCOUNT PRO

THERE'S NO NEED to throw out fresh produce simply because it's ripe, spotted, or slightly damaged. Many retailers are convinced that if handled properly, it can be sold successfully at a discount price without detracting from the appearance of the produce department and without substituting to a significant degree for regular merchandise.

AMS marketing specialists recently studied three bulk produce departments of two East coast supermarket chains and found that throwing out ripe, spotted, and slightly damaged produce may not be good business. Consumer acceptability of this produce may be just as good as (and in the case of ripe produce better than) other merchandise on the same display. The produce just needs to be moved quickly because it is susceptible to rapid deterioration and total loss.

A discount display rack can provide a sales outlet for this merchandise and permit some of the total value of the product to be saved. The 3 test stores studied by AMS realized 42.34 percent of the full retail value for their discount merchandise.

Or, to put it another way, these stores were able to increase their gross margin by $42.34 for every $100 worth of produce discounted rather than thrown away.

How much sales from the discount rack substituted for sales of regular merchandise was not measured by AMS. No doubt, there was some substitution, but probably not nearly as much as the quantity of produce discounted. Depending on the percent of substitution, a retailer with a gross margin of 28 percent of sales from regular produce can increase his margin from $14 to $42 for each $100 worth of discounted, rather than discarded, produce.

To make discounting profitable, four basic rules must be followed:

- Discount only merchandise with consumer acceptability.
- Offer good value.
- Handle discount merchandise carefully and promptly.
- Keep the discount display rack clean and orderly.

In every produce department there is some loss due to deterioration and waste. So, don't expect to move everything to the discount rack. When displays are being culled, throw away all items which show signs of spoilage. A customer is the first to realize that spoiled merchandise does not represent a bargain at any price.

Then, be sure the price of the discount produce is low enough to sell it immediately. A delay in sales may mean no sales at all, because the produce has, in the meantime, spoiled.

One of the major problems in discounting is getting the produce quickly to the discount rack. Any improper handling or delay will hasten deterioration and turn possible returns into absolute losses.

In the three test stores, the typical method of handling discount produce was for the display clerk to separate this produce from the regular stock, put it in a shopping cart, and take it to the weigh-out clerk. Here, the merchandise accumulated until the scale attendant found time to place it in an open till and move it to the discount rack.

During this period, the wires of the shopping cart cut and damaged

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DUCE

by PATRICK J. CASSIDY

the merchandise. The produce leaked through the cart and caused an unsightly, unsanitary condition. The cart itself blocked the aisle, and the produce stood, often for extended periods of time, awaiting handling.

If produce is to be discounted, this is NOT the procedure to follow. A much better method is to move the discount merchandise from the display counter directly to the discount rack. This way, the merchandise is handled fewer times and not left to accumulate and ripen further.

AMS marketing men designed a discount merchandise holder to fit between the handle supports of a two-shelf display dolly. This holder provided storage space for the clerk's box opener, empty tills, and other supplies used in the display work. When the display clerk culled the displays, he placed the discount merchandise in an empty till placed on top of the holder. The next time he passed the discount rack or made a trip to the back room, he deposited the full tills directly on the discount rack.

When merchandise is processed in the back room, the same procedures can be followed. The thing to remember, however, is to move it to the discount rack promptly.

Although the open till display method makes it somewhat difficult to keep the discount rack orderly at all times, it offers two distinct advantages. Quality control is simplified, and customers have a chance to inspect, compare, and select the merchandise they want. Discount produce packaged in paper bags with transparent windows make a neat display and prevent rummaging, but the bags do not give the customers a good view of the merchandise. Since prospective buyers cannot fully see what they are purchasing, they may be reluctant to purchase at all. Or, if they do purchase, they may be disappointed upon inspecting the merchandise when they get home.

Similarly, produce personnel cannot keep a close eye on the quality of bagged discount produce. Also, many produce items, when placed in closed containers, ripen and deteriorate more quickly than they would if they were exposed to the air.

Since the chief reason for discounting is to attempt to realize a return from produce which has a value only if it is moved quickly, the discount rack must attract customers in every way it can. Produce that is displayed in an open till and is available for inspection is one way to do this. Another is to place the discount rack in a conspicuous place in the produce department.

Many produce managers consider the discount rack an eye-sore, so they try to hide it. This defeats the very purpose of discounting. A clean, well-kept discount rack need not detract from the appearance of the produce department. In fact, it may even add to it indirectly, because the rack offers store personnel a place to put slightly bruised and spotted produce, thereby clearing the regular display of this merchandise.

AMS marketing specialists list four rules to follow when selecting a location for the discount display rack. They recommend that it be placed:

- In a high customer traffic area;
- Close to the person who is assigned the job of keeping the rack clean and orderly;
- So that it is convenient to stock;
- Away from the regular produce displays, but within the general boundaries of produce department.

It is not necessary to invest a large amount of funds in equipment and supplies to operate a discounting program. Often, required equipment can be improvised.

One of the most important things to remember about discounting is that it will not function properly if it is treated like a step-child. It must be accepted in the produce department as a full fledged family member or not at all.

PRICING SOYBEANS BY DIELECTRIC ANALYSIS

by HARLAND N. DOUGHTY

SOYBEAN producers and elevator operators have been doing a fairly good job of estimating the value of oil in soybeans, but AMS marketing researchers feel there is still room for improvement.

A method which promises to reduce the margin of error in pricing individual lots of soybeans at the elevators is "dielectric analysis." It is simple enough for the nonskilled work crew to handle after brief instruction. A preliminary study shows that with proper care an elevator worker can obtain results within 0.5 percent of the oil content determined by the laboratory method in 2 times out of 3.

To date, pricing soybeans has been based on U.S. grading standards. Although this method is the best yet devised, it does not measure oil content. And, as a result, grade standards work only for the long-term average for a large number of growers when all grades are taken into consideration.

Market researchers recently compared 500 soybean samples priced by the dielectric and grading systems. In two-thirds of the cases, the variation in oil content value for both systems, when compared with laboratory analysis, was plus or minus 4 cents—a range of 8 cents per bushel. However, the dielectric method provided the percentage of oil content not obtainable from the present method of estimating the market value of soybeans by official factors.

All of which means that, using either system, the money paid out for soybeans at the elevator would be just about the same for overall sales. But the individual farmer who produces soybeans with a high oil content may be paid too little money, and the farmer who produces beans with a low oil content may be paid too much.

The dielectric equipment is fairly simple for the ordinary elevator worker to handle. A mixture of solvent and oil from a finely ground sample of soybeans is placed in the path of an electric current. The greater the amount of oil present, the harder it is for the electric current to flow through the mixture. The resulting frequency changes in the current are indicated on a meter. These meter readings can easily be translated into the percentage of oil content.

The dielectric instrument has been in limited use for some time in the industry, mainly to test oil content before harvest, for individual tests at the processing plant, and for certain plant control tests.

The reason the method hasn't been used for elevator sales has been the variation in test results.

But, the survey showed that this variation can be reduced appreciably if reasonable care is practiced during testing. About 23 percent of the variation in oil content from the amount measured by laboratory analysis apparently resulted from a gradual change in the electronic balance of the oil testers, as well as the dulling of the cutting knives. Another 46 percent of the total variation came from differences in adjustment of the 3 testers, possible differences in the average temperature of the test cells and solvent, insufficient warming up and inadequate cleaning of the test cells, and carelessness in the test procedure.

Taking such causes of variation into account, the dielectric oil tests come to within 0.5 of a pound of the laboratory results in about two-thirds of the tests—or within 0.8 of a pound in 99 tests out of a 100.

Another way to bring the dielectric tests closer to laboratory tests is to repeat the test runs. By running the samples through the testing machines 4 times, the variation in results could be reduced to 0.4 pound, or a little over 4 cents per 60-pound bushel in 99 times out of a 100.

Classifying the soybeans according to U. S. grades does give the farmer and the elevator operator some idea of the oil content. Generally, the higher grades sampled had more oil than the lower ones. However, there is a considerable variation in oil content within most grades and, consequently, there is variation in the oil value of soybeans meeting the same grade requirements.

With further improvements in the dielectric equipment and technique, this method of testing soybeans at the elevator should help to bring the price paid for individual lots closer to the actual value of the beans.

Harland N. Doughty is a staff member of the Marketing Research Division of AMS.

Objective Grading of Tomatoes for Processing

MOST OF US have as much trouble judging a tomato by the looks of its skin as we do a book by its cover.

Sometimes Federal-State inspectors have the same problem. They grade tomatoes used for processing by judging outside color and defects. In doubtful cases, they cut the tomatoes in half and check the color of the flesh. But this inspection is entirely subjective.

Scientists in the Marketing Research Division of AMS are investigating possible ways to develop more objective grading. Already, they've found it is possible to evaluate tomato quality by objective color analyses combined with a subjective estimate of defects.

Since color is one of the most important factors indicating the quality of tomatoes, researchers first concentrated their attention on this aspect of inspection. They used photoelectric instruments to objectively measure the color of raw tomatoes.

Five of these instruments were tested under field conditions. They measured small differences in the color of the skin, flesh, and raw juice. From these tests, researchers found that raw tomato juice offered the most promising method of objectively evaluating tomato color.

Under the present inspection system, inspectors place tomatoes for manufacture of strained tomato products in either of three tomato grades —U.S. No. 1, U.S. No. 2, or culls. These three separations are based on a combination of color and freedom from defects.

Any additional subdivisions on the basis of color alone are impractical, if not impossible. The new photoelectric instruments, however, would make color subdivisions more feasible.

It may also be possible, through current research, to establish new procedures for evaluating the extent of defects. At present, inspectors also base their grades on discolored growth cracks, shriveling, molds, decay, sunburn, sunscald, freezing, etc.

A more objective analysis could be made by considering defects as a single factor and then combining this with a value for color. This could be done by selecting samples from the load and removing the defects. Sub-samples could then be selected and the juice extracted, blended, and measured on the instruments. The color value, combined with the percent of defects, would determine the quality of the load.

AMS researchers are also studying methods of sampling. They've looked into expected sampling errors with variations in the number of hampers selected from the loads and in the number of tomatoes selected from the hampers.

This rather extensive research into all phases of color and defect analysis has demonstrated that a new inspection procedure is possible. Some day such a method may supplement or replace the present grading procedure.

A more detailed account of the AMS work on objective tomato grading will be published this spring in a marketing research report entitled "Judging Quality of Tomatoes for Processing by Objective Color Evaluation with Subjective Estimation of Defects" by John N. Yeatman and Arthur P. Sidwell.

Walter A. Davidson answers some questions about

The Federal

Q What is the Federal Seed Act?

A It is a Federal law passed in 1939 to insure truthful labeling of agricultural and vegetable seed in interstate commerce and to control the quality of such seed imported into the United States.

Q Who benefits from the Act?

A The farmers, truck gardeners, and all people who buy seed which moves in interstate commerce. The Act helps to provide fair competition among seed dealers.

Q Are all kinds of seed subject to the Act?

A No, only specific kinds of agricultural and vegetable seed intended for seeding purposes. Trees and flower seeds do not come under the Act.

Q Are all seedsmen subject to the Act?

A No, only those who sell, offer for sale, ship or advertise seed in interstate commerce. State seed laws control seed offered for sale and sold within the State.

Q How do seed buyers benefit from the Act?

A From the information on the label, which must correctly state the purity, germination, and noxious-weed content of the seed, the buyer knows exactly what is offered. He can readily determine whether the seed is the quality he desires and whether it is suitable for planting.

Q What information is required on the label of seed moving in interstate commerce?

A The kind of seed and its lot number must be plainly marked on the tags on all agricultural seeds. Next must come a listing of percentage of pure seed, crop seeds, inert matter, and weed seeds. The percentages of germination and hard seed also appear on the label as well as the date of the test. Noxious-weed seeds are listed by name and rate of occurrence in accordance with the law of the State into which the seed is shipped. The full name and address of the interstate shipper follows. For alfalfa, red and white clover, and open-pollinated corn, origin is also required on the label.

The name of the kind and variety of the seed, together with the name and address of the interstate shipper, must be shown on all packages of vegetable seed that is above a certain standard of germination. If the seed is below that standard, it must also be labeled to show the percentage of germination, the date of the germination test, and the words "below standard."

Q Who tests the seed before it is labeled?

A Tests are usually made by the seedman's own laboratory or a commercial laboratory. Some State seed laboratories also test samples for labeling purposes.

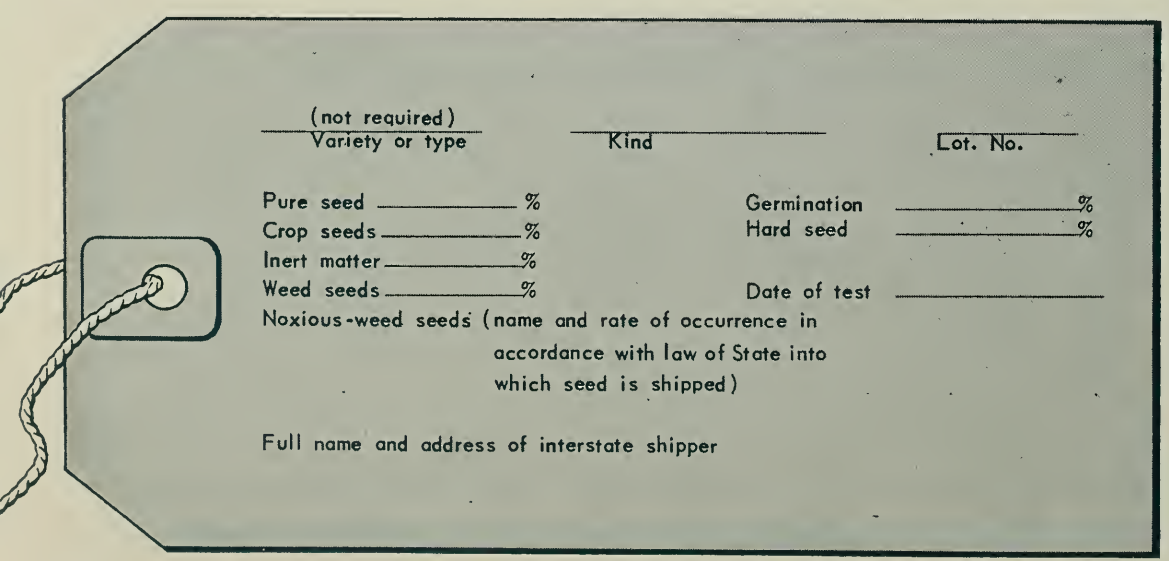
Q Who tests the seed to determine whether it is correctly labeled?

A Samples drawn by State inspectors are tested in official State and Federal laboratories.

Q How should seed be labeled if it is shipped in interstate commerce to be cleaned?

A "Seed for Processing."

Mr. Davidson is Chief of the Seed Branch, Grain Division, AMS.



Under the Federal Seed Act, this tag must appear on all agricultural seed moving in interstate commerce. Packages of vegetable seed also must be labeled under Act.

Seed Act

Q Is advertising seed in a local paper subject to the Federal Seed Act?

A Yes, if the paper is distributed through the United States mails.

Q Does the Federal Seed Act apply to grain shipped to an elevator or feed store for manufacturing or feeding purposes?

A No, only to seed intended for seeding purposes.

Q Is seed shipped in bulk, such as in boxcars or in trucks without bagging, required to be labeled?

A Yes, the labeling information must appear on an invoice accompanying the shipment.

Q Is a farmer ever subject to the Act even though he may never actually sell or ship seed to a purchaser in another State?

A Yes, he may be if he signs a grower's declaration or makes any other representation as to the variety or origin of seed which is in a "current of commerce" expected to take it into another State. The farmer should keep a sample of his seed and a copy of any document, such as a grower's declaration, for his own protection. A grower should not make a declaration as to the variety of the seed unless he can support his statement.

Q Does the Federal Seed Act provide for collecting damages when the farmer or planter finds that he has planted falsely labeled seed that moved in interstate commerce?

A No, the Federal Seed Act does not provide for collecting damages between a buyer and seller of seed. This is a matter to be settled between the contracting parties.

Q How does the Federal Seed Act deter seedsmen from shipping seed which is falsely labeled?

A Under the Federal Seed Act, whenever it is believed that the public interest may be adequately served, a suitable written notice or warning is issued. A Federal court may also seize and dispose of falsely labeled seed. The Act further provides for criminal prosecution and civil action with maximum fines of $1,000 on the first criminal offense and $2,000 on subsequent offenses, or a maximum of $500 for each civil offense.

Q How do we know that the Federal Seed Act has been effective in reducing the amount of falsely labeled seed?

A Figures compiled from various State records show that the percentage of falsely labeled seed was reduced from approximately 25 percent in 1939 to 8 percent in 1956.

COUNTING NUMBER OF HEALTHY SEEDS IN GERMINATION TEST.

Q How can a grower or purchaser of seed provide evidence for use under the Federal Seed Act?

A By keeping a sample of the seed purchased together with the label and any other records pertaining to the seed until he finds that the seed is satisfactory.

Q To whom should this evidence be referred?

A To the State department of agriculture which cooperates with the USDA in the enforcement of the Federal Seed Act or to one of the following Federal or Federal-State seed laboratories:

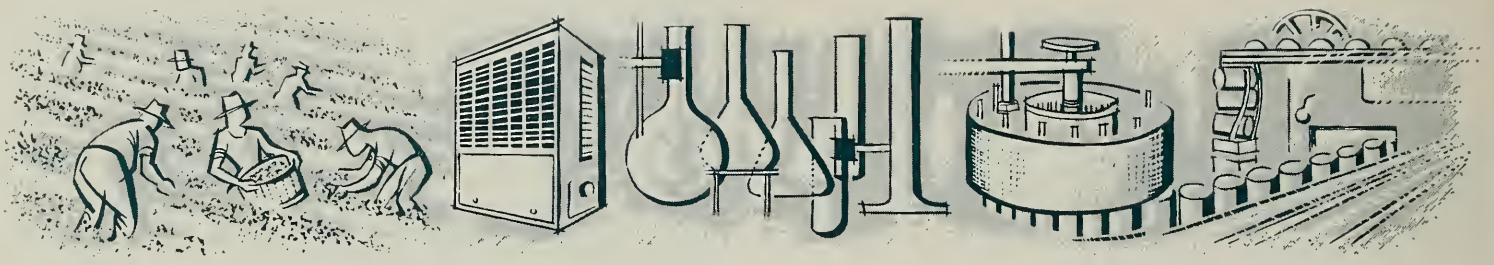
Federal Seed Laboratory, 212 Old Post Office Building, Montgomery 4, Alabama;

Federal Seed Laboratory, 325 U.S. Courthouse, Kansas City 6, Missouri;

Federal Seed Laboratory, 116 Federal Office Building, Minneapolis 1, Minnesota;

Federal-State Seed Laboratory, 1220 N Street, Room 323, Sacramento, California;

Federal Seed Laboratory, Seed Branch, Grain Division, AMS, 209 South Laboratory Building, Beltsville, Maryland.



MARKETING BRIEFS ON

THE CHANGING MARKET

Freezing home-produced meats

Farm families are taking advantage of modern refrigeration facilities to store home-produced meats. Instead of buying their meat in town, they are able to draw more than half of their supply from their own livestock.

Cold storage lockers at central locker plants were the first freezing units to be used generally by farmers back in the 1930's. Then, the home freezer became popular after World War II. By 1954, 64 percent of all farm families had a freezer, locker, or both. In all regions, except the South, more than 75 percent were so equipped.

Much more beef than pork is frozen. The amount of beef frozen per farm household varied considerably from one part of the country to another. In 1954, it ranged all the way from a 65-pound average in the South to 227 pounds in the West. The same variation existed for pork. An average of 42 pounds of pork was frozen per household in the South, but as much as 129 pounds in the North Central States. These averages, however, include all farm families. The quantities would, of course, be higher if only those families having a freezer or locker were considered.

Freezing is particularly well suited for beef and fills a need of long standing. Previously, farmers could preserve beef only by canning.

Storage of pork, on the other hand, has always been possible by curing. That's why, before refrigeration became available to farmers, much more pork than beef was produced at home for farm family use.

Production of beef for use on the farm has risen sharply in recent years and now nearly equals the amount of pork produced for farm use. Because pork is much more popular than beef in the South, the sharpness of the beef gains in other regions is obscured. Outside the South, more farm households now produce beef than pork for home use, and they produce it in a larger quantity than pork.

In terms of consumption per person, the farm rate for home-produced beef has about tripled since the early 1920's. Pork has dropped about 20 percent.

Cotton marketing agencies can do grower organizations a favor by reminding them it's time to start on applications for free classing and market news services provided by the Smith-Doxey Act. For details, contact county agents or classing offices of the Agricultural Marketing Service.

Processing soybeans for oil

Chemical processing of soybeans for oil has about squeezed out the old-fashioned and less efficient hydraulic and screw press methods. Solvent extraction was used for about 95 percent of the beans processed in 1956-57. Screw press handled most of the remaining 5 percent.

Ten years ago, solvent extraction accounted for only 28 percent of the beans used for oil.

A comparison of the processing operations shows that the solvent extraction method gets the most oil out of the beans. Last season, solvent extraction yielded 10.9 pounds of oil per bushel of beans crushed. Yield by the screw press method was about 9.4 pounds per bushel.

Food marketing costs

Percentagewise and dollarwise, food marketing costs are at the highest level since 1940. In 1957, these costs amounted to 60 percent of the retail cost of food.

Because of the high degree of processing and personal services required to process and deliver cereal and bakery products to the consumer, marketing costs make up a considerably larger part of retail costs for these products than for other foods. Seventy-nine percent of the retail cost of bakery and cereal products last year went for marketing operations.

The marketing cost for fruits and vegetables is also high. In 1957, it was 72 percent of the retail cost of these items.

Meat products required about 47 percent of the retail cost for processing and distribution. But poultry and eggs, for which markets have expanded rapidly over the past several years, required only 38 percent for marketing costs.

Sharing America's Abundance

"Never in history has a Nation been more generous in making its food supply available to the needy than has the United States during the last 5 years."

This statement by Secretary of Agriculture Ezra Taft Benson was made at a recent National Conference on Food Donations.

"Donations from our abundance are now going to more than 75 million people in our own land and to other countries around the world. Included are school children, persons in institutions, and needy families here at home; and needy people in nearly 100 other countries. We are humbly grateful for this blessing of sharing our good fortune with others," the Secretary added.

He told of seeing first hand, on his trip overseas, how USDA-donated foods are helping less fortunate peoples. He cited specifically Japanese children who are participating in a school lunch program that brings them, for the first time, wheat bread and milk.

And, of course, there are similar programs in other parts of the world. In the last 5 fiscal years, 6½ billion pounds of USDA-surplus stocks, with a value of $1,690,000,000 have been donated at home and abroad. Foreign distribution alone totaled more than 3½ billion pounds, with a value of $827,000,000.

The job, as Secretary Benson pointed out, is a tremendous one, and a job being well done. But he warned against complacency.

"We must look ahead to ways to make the program better," he said. At the same time, "we must keep it above suspicion. We must stress that recipients are in no way obligated to make payment of any kind, either in cash or services, or by participation in any religious or political activities."

Moses A. Leavitt, chairman of the American Council of Voluntary Agencies for Foreign Service, Inc., pointed out that through voluntary agencies "a bond of friendship has grown between the people of America and the people of countries far removed in culture, geography, and ways of life." With notable results, these agencies have sown the seeds of peace in areas of greatest tension and need, he said.

Miss Margaret A. Hickey of the Advisory Committee on Voluntary Foreign Aid told of her "40 days around the world." Overseas as a member of a team of Red Cross delegates to the International Congress in New Delhi, Miss Hickey visited Iran, India, Thailand, Cambodia, and the Philippines.

She stressed the tremendous need for food in Southeast Asia, where "even those who are trying to help are hungry because, with their respect and pride, they cannot reach into the rice bowl." She felt that more should be done through nongovernmental voluntary partnership in "this matter of humanitarian technical assistance projects."

Howard P. Davis, Deputy Director, Food Division, AMS, and chairman of the conference, reported on U.S. aid abroad as he had seen it while traveling with Secretary Benson.

He then turned the attention of the audience to surplus distribution projects at home. "We are not, however, neglecting our own people," he said. "We have had very substantial distribution programs in this country as well and here, too, have made constructive use of surplus foods."

Dr. Edgar Fuller, executive secretary of the National Council of Chief State School Officers, discussed the importance of the school lunch program and its distribution of surplus commodities.

He pointed out that the school lunch program is a billion-dollar-a-year program. Throughout the country, he said, teachers consider it a great asset to the educational program.

Dr. Parke Brinkley, commissioner of the Virginia State Department of Agriculture, told of other ways surpluses can be used at home.

"One of the best ways I know to get rid of farm surpluses," he said, "is to make them available to our own less fortunate people who are in real need of help through no fault of their own.

"We in the Virginia Department of Agriculture are proud of what we have been able to do with these commodities, with the help of other agencies. I also know that a great many Virginians are grateful to the American farmer and, like me, thank God that our farmer's problem is surplus production that can be shared with his less fortunate brother."

NEEDY FAMILIES IN 40 STATES ARE GIVEN FOOD FROM U. S. SURPLUS SUPPLIES.

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The Poultry Industry Prepares for Inspection

by DR. EDWARD H. HAGEMAN

With May 1 as the target date, both the poultry industry and the Poultry Division of USDA's Agricultural Marketing Service are busy getting ready for the start of inspection service under the Poultry Products Inspection Act.

During January and February, AMS inspection service personnel conducted training schools at Kansas City, Mo., for approximately 80 veterinarians who will be station supervisors for the new "compulsory" inspection service. These men were given intensive instruction, chiefly in methods for training other station supervisors and the corps of lay inspectors that will be needed to implement the new inspection law.

Meanwhile, poultry processors have been readying their plants to receive inspection. The law requires that all poultry moving in interstate or foreign commerce be inspected for wholesomeness after January 1, 1959. However, the new service may be provided to approved plants as early as May 1.

Plants now receiving voluntary inspection on a fee basis would benefit by receiving the government-paid service under the new law at the earliest possible date.

These plants, however, must follow the same procedure as those which have not previously received inspection service. They must file applications, must have accurate blueprints on file with USDA (including not only floor plans but also plot plans and building elevations), and must comply in all respects with the facilities and operating requirements of the new regulations before service can be installed under the Poultry Products Inspection Act.

Since it takes approximately 2 months after approval of an application before service can be started, poultry processors not operating under the voluntary program also are urged to get their applications in as early as possible.

Applications can be expedited if processors are careful to fill out forms completely and make a thorough study of the regulations which were issued February 5.

Inspection service personnel find that one of the most common mistakes made in filing applications is failure to submit building elevations together with the floor plan and plot plan blueprints.

Another common error is omission of street address and date of application on the forms and blueprints, and the date on which service is desired. Processors whose plants do not have a street address should substitute a description of the location, such as "on Highway 10, 1 mile east of the post office."

Operators of small plants which do not now receive inspection service have expressed some concern about meeting requirements. Such processors may, if they so desire, write to the Poultry Division for advice on their particular problems.

The problem of providing the new service to all plants which will be required to have inspection under the Poultry Products Inspection Act is one which will require close industry-government cooperation.

As of February 1, 356 plants were receiving voluntary poultry inspection and 295 applications were pending. It is expected that more than 750 plants will be operating under the "compulsory" service after January 1, 1959.

The Poultry Division, AMS, is making every effort to provide inspection as quickly and efficiently as possible. Copies of the new regulations, application forms, and information bulletins are being sent to all plants now receiving voluntary inspection, those with applications pending, and others who have requested them.

Anyone planning to obtain inspection service will find valuable information in the following recently issued publications:

Questions and Answers on the Poultry Products Inspection Act (AMS-208)

Information for Applicants for Poultry Inspection (AMS-219)

Regulations Governing the Inspection of Poultry and Poultry Products.

Copies of these publications may be obtained from the Poultry Division, Agricultural Marketing Service, U.S. Department of Agriculture, Washington 25, D.C.

Dr. Hageman is Head of the Facilities Section, Inspection Branch, Poultry Division, AMS.